

# “Vision 2009”

For the Future of Tokyo Institute of Technology

April 2009

Tokyo Institute of Technology



# **“Vision 2009”**

## **For the Future of Tokyo Institute of Technology**

### **Overview**

Tokyo Institute of Technology (hereinafter, “the Institute”) has, over a period of almost 130 years, continued to nurture outstanding scientists and engineers, produce excellent research results, and play a role in supporting *monotsukuri*: the driving force behind Japan’s development.

We have formulated “Vision 2009”: A Vision for the Future of Tokyo Institute of Technology, focusing on the next ten years, with a view to enabling the Institute to fulfill this mission over the long term and contribute to ongoing world development in the midst of the unprecedented difficulties facing humankind. “Vision 2009” clarifies the “shape” of the Institute we aspire to, and comprises guidelines for achieving our long-term goal: to realize a truly world-class science and engineering university.

“Vision 2009” defines our primary objective for the coming ten years as follows:

Tokyo Institute of Technology regards nurturing “knowledgeable, skilled, ambitious, peace-minded and harmony-seeking<sup>i</sup> scientific creators<sup>ii</sup> of the times” to be its primary objective. We will endeavor to enhance the Institute’s overall standing<sup>iii</sup> from a global perspective, prioritize strengthening fields capable of contributing to society, and create new values. We will respect freedom and diversity, pursue fairness, and strive to engender the trust of the world.

With a view to realizing the goals mentioned herein, the content of “Vision 2009” should be regarded as a summary of key elements rather than a comprehensive document. In concrete terms, we have summarized the following elements to enable the Institute to continue developing as a university that enjoys the trust of citizens at large and in which both students and faculty can take pride and pleasure, and as a science and engineering university that engages in all-round character building on a foundation of scientific knowledge through realization of this vision.

- Education
- Research
- Contribution to Society
- International Cooperation

- Organizational Review
- Strengthening of our Management Base
- Promotion of Integrated Use of Campuses

We will strive to manifest the content of this vision by appropriately reflecting it in the formulation of our second set of mid-term objectives and plans (fiscal 2010-2015), establishing a special task force directly under the president, pressing ahead with formulation of an action plan and considering the feasibility of realizing fiscal resources and organizational systems.

In other words, the vision will provide the Institute with guidelines on how to lead reform in tertiary education and realize “a truly world-class science and engineering university.”

## **“Vision 2009” For the Future of Tokyo Institute of Technology**

Towards nurturing “knowledgeable, skilled, ambitious, peace-minded and harmony-seeking scientific creators of the times”

Tokyo Institute of Technology (hereinafter, “the Institute”) has, over a period of nearly 130 years, continued to nurture outstanding scientists and engineers, produce excellent research results and play a role in supporting *monotsukuri*: the driving force behind Japan’s development.

We have formulated “Vision 2009”: A Vision for the Future of Tokyo Institute of Technology, focusing on the next ten years, with a view to enabling the Institute to fulfill this mission over the long term and contribute to ongoing world development in the midst of the unprecedented difficulties facing humankind. “Vision 2009” clarifies the “shape” of the Institute we aspire to, and comprises guidelines for achieving our long-term goal: to realize a truly world-class science and engineering university.

### **I. Primary Objective** (Primary objective for the coming 10 years)

Tokyo Institute of Technology regards nurturing “knowledgeable, skilled, ambitious, peace-minded and harmony-seeking<sup>i</sup> scientific creators<sup>ii</sup> of the times” to be its primary objective. By doing this, the entire university will cooperate to enhance the Institute’s overall standing<sup>iii</sup>, prioritize strengthening of fields capable of contributing to society from a global perspective, and create new values. We will pursue fairness whilst respecting freedom and diversity, and strive to engender the trust of the world.

### **II. Education**

#### 1. Guarantee and improve the quality of education

- (1) Provide education from a long-term perspective with a view to achieving our educational goals through our undergraduate, masters, doctoral and professional degree programs, and develop mechanisms capable of actively responding to changes in societal needs and trends in the industrial economy. Engage in educational activities systematically on a departmental basis, or in collaboration, by structuring the curriculum on this. Take measures to guarantee the excellence of Tokyo Institute of Technology’s students. (Review the number of students to be admitted and the entrance examination; try small group instruction and instruction by multiple faculty; utilize external lecturers and tutors; clarify students’

graduation requirements, etc.)

- (2) Thoroughly and basically reform the education system for masters programs, and formulate and implement strategies to guarantee a consistent quality of education from the point of enrollment in both the undergraduate and graduate schools.
- (3) Consider adopting a dormitory system for all first year students and enhance the quality of student dormitories by positioning them as an educational facility; reinforce liberal arts education and take other measures to promote all-round character building; and nurture highly ambitious and moral human resources with the desire to understand the essence of things and cooperate with people around the world toward a common goal.
- (4) Assuming the establishment of specialized knowledge and skills, endeavor to strengthen communication skills relevant to internationalization by enhancing subjects that cultivate internationalism and other means with a view to nurturing global human resources capable of demonstrating leadership in society.
- (5) Improve the care taken of students in terms of education, research guidance, etc. to enable them to enjoy a pleasant and unrestricted student life. Enhance the Institute's environment and facilities by establishing recreational areas for students, building new lecture halls, etc., with a view to improving its amenities.
- (6) Position the attached high school of science and technology as a pilot school for nurturing the vast number of human resources specialized in science and technology, and promote collaboration between Tokyo Institute of Technology and the high school.

## 2. Review the education system

- (1) Review departments and schools that take the lead in changing paradigms after reconsidering the lecture and research division systems and enhancing the rationality of the education system. Aim to rejuvenate and reenergize the system.
- (2) Use multidisciplinary institutes such as the Institute for Education and Research in Information and the Institute for Education and Research in Energy Environments (provisional names), etc. to forge ahead with reorganization of individual graduate courses, and reform of Tokyo Institute of Technology as a whole.
- (3) Strengthen adult education, including the Career Advancement Professional School. In particular, establish international standardization

and unique MBA courses.

(4) Strengthen systems for education in liberal arts, social sciences and the arts. Consider restructuring related graduate courses to facilitate this.

### III. Research

#### 1. Create new academic fields

(1) Create new academic fields and systems that go beyond conventional frameworks, including those that integrate liberal arts with the sciences.

(2) Pay adequate attention to securing the research funds and space necessary to promote basic and challenging research that conventionally should be encouraged by Tokyo Institute of Technology as a university.

#### 2. Create new values by systematically strengthening research

(1) Select research fields in which Tokyo Institute of Technology can demonstrate its strengths on a university/departmental basis, and strengthen the Institute's institutional research capacity by concentrating investment of resources in these areas, etc.

(2) Aim to create new industries from the results of research.

(3) Promote problem-solving-oriented research based on the comprehensive planning, investigation and analysis involved in research such as solution research, etc.; strive to make ensuing research results "more visible" (active presentation), and enhance its social presence.

(4) Take measures such as appointing career advisors to help young researchers develop their abilities, and strengthen support for nurturing researchers.

(5) Afford doctoral students and young researchers opportunities to engage in research at world-class universities overseas, and help not only researchers at universities, but also highly advanced professionals to develop their abilities.

#### 3. Establish a hub for international collaborative research

Rally researchers with diverse global perspectives and establish an international collaborative research hub to contribute to addressing social needs and solving global issues.

#### 4. Strengthen the information infrastructure

(1) Strengthen the infrastructure for information communication networks.

(2) Enhance information service functions in the new library.

(3) Enhance the computer environment encompassing TSUBAME<sup>iv</sup> and press

ahead with making it a global hub.

#### IV. Contribution to Society

1. Strengthen dissemination of information on science and technology
  - (1) Strengthen the Institute's capacity to provide information on science and technology, and enhance the Institute's status as a science and technology consultant. Strive to ensure that skills and talents of scientists and engineers are appropriately evaluated by society.
  - (2) Actively pursue involvement in society and strengthen the Institute's capacity to propose measures based on science and technology.
  - (3) Develop a bank of human resources capable of contributing to society in the field of science and technology such as science and technology cooperation overseas through ODA (Official Development Assistance), etc.; include former faculty members capable of engaging in social action programs in this endeavor.
  - (4) Support efforts to popularize science education among young people and expand unique adult education programs from the standpoint of promoting cooperation with and contributing to the local community.

#### V. International Cooperation

1. Establishment of a "Top League Network for Science and Engineering Universities" and strengthening of international cooperation

Create a network of world-class science and engineering universities, and thoroughly promote internationalization by establishing education and research areas with satellite labs<sup>v</sup>, etc. and promoting human resource exchange through joint research and education.
2. Enhancement of students' internationalism and nurturing of excellent international students
  - (1) Create a system for ensuring all students experience going overseas at least once before completing a master's program.
  - (2) Formulate region-specific strategies for attracting international students and endeavor to secure excellent international students. Promote the acquisition of international students and post-doctoral researchers from Central and Eastern Europe, and strategically increase the number of international students from the other regions in the West. Cooperate with universities in Asia and the West, and seek ways to strengthen ties with the Middle East.
  - (3) Enhance the efficiency of information; provide English lectures and

Japanese lectures appropriate for international students; implement entrance examinations overseas; increase the number of students awarded scholarships; build more student accommodation; and enhance various lecture systems to ensure that they correspond to the norms of internationalization.

- (4) Clarify the roles of overseas hubs and strategically increase the number of hubs after streamlining their structure.

## VI. Organizational Review

### 1. Radical improvement of the flexibility of the organizational structure

- (1) Establish a structural reform promotion team mainly comprising young people to promote reorganization of the education system with a view to creating a system for its expeditious reform. Basically, build a timely and flexible organizational structure for research. Also, newly establish a system for effectively pursuing expeditious research into pressing issues such as energy and the environment.
- (2) Position the new Integrated Research Institute (provisional name) as a platform for experiments in organizational review and construct a flexible system for solution research conducted on the basis of secondment from affiliated organizations, etc.

### 2. Secure a multifarious staff in an outstanding faculty

- (1) Create university-wide guidelines for selecting and recruiting faculty, and instill a common understanding of recruitment activities throughout the Institute to ensure that outstanding faculty is selected from a global perspective and a multifarious staff is assembled. In particular, set numerical targets for women, non-Japanese and graduates from other universities, and aim to achieve them.
- (2) Secure a system conducive to selection of outstanding associate professors, and create an environment that allows them to feel calm and secure and demonstrate their abilities in education and research.
- (3) Take the diverse nature of faculties' contributions into account when clarifying how they will be evaluated and how such evaluations will be used.
- (4) Create a management professor<sup>vi</sup> system and establish a system for efficient organizational management that enables faculty to devote themselves to education and research.

### 3. Reform of the Administrative Departments

- (1) Review the division of roles between administrative staff and faculty, and reorganize the allocation of responsibility for formulating and implementing plans with a view to constructing a new system for cooperation between them.
- (2) Substantially enhance departmental faculty support services.
- (3) Improve the efficiency of the Administrative Departments by promoting operational improvements, and strive to improve the quality of services such as support for education and research activities by improving expertise.
- (4) Strengthen the Administrative Departments' capacity to formulate and issue coordinated international responses.

## VII. Strengthening of Management Infrastructure

### 1. Enhancement of the Tokyo Institute of Technology brand and its nationalization/internationalization

Make the existence of the Institute known among sectors of the populace which may not have received adequate attention, in order to make Tokyo Institute of Technology brand more widely known domestically and internationally. Establish a fresh brand image for the Institute, nurture a common understanding of this image, and disseminate it widely throughout the world.

### 2. Strengthening of cooperation with alumni, etc. and nurturing of a culture of donations

Enhance cooperation and collaboration with the activities of the Alumni Club and provide services such as proactive dissemination of information to Tokyo Institute of Technology alumni. Build cooperative relationships with alumni and former faculty to enhance development of the Institute. Use the Institute's 130th anniversary to enhance the system for soliciting donations and link this to strengthening its financial standing. At the same time, encourage faculty members to cooperate with each other.

### 3. Promotion of cooperation with other universities

Cooperate with other universities in Japan and overseas, and advance and internationalize Tokyo Institute of Technology's education, research, social contributions and management. Utilize the Four-University Alliance<sup>vii</sup> to develop education and research in a broad array of fields.

### 4. Strengthening of Tokyo Institute of Technology's financial standing

- (1) Establish a system for ensuring the effective use and maintenance of assets such as land and buildings, and consider using land on the Tamachi Campus, for instance, to address needs for new facilities.
- (2) Increase external funds, self-generated income and donations. Strive to suppress fixed expenses, and make effective use of assets by making budgets more flexible and rationalizing methods of procurement to ensure efficient execution and utilization of fixed assets, etc.

#### 5. Strengthening of frameworks for compliance and risk management

Establish frameworks for compliance and risk management. In particular, review the system for procurement orders and ensure proper execution at all times by improving rationality and transparency through the introduction of information technology. Strive to ensure total faculty compliance and establish a system for supporting faculty compliance.

Promote measures to ensure Tokyo Institute of Technology is able to fulfill its social responsibilities as a university that considers both continuation of its business activities and attention to the local citizenry, both during regular operation and in the advent of a large-scale disaster or epidemic.

#### 6. Establishment of an international evaluation panel

Establishing a Tokyo Institute of Technology International Evaluation Panel comprising presidents, among others, of internationally renowned universities; substantiate self-evaluation; and strive to improve the university brand's international standing.

### VIII. Promotion of the Integrated Use of Campuses

#### 1. Promotion of rational effective use based on an integrated campus plan

- (1) Review role sharing between campuses, consider redevelopment of each campus and renew campus plans with a view to making rational and effective use of each of the Ookayama, Suzukakedai and Tamachi campuses.
- (2) Consider concentrating undergraduate schools on the Ookayama Campus and organizational reform of graduate schools, research institutes, etc. when considering and implementing campus plans.
- (3) Prioritize safety measures on each campus and promote them in an integrated manner.
- (4) Pay attention to the contributions each campus makes to its local community.

## 2. Promotion of campuses with reduced impact on the environment

Strive toward environmentally friendly campuses that consider factors such as energy saving, waste reduction and reduced output of greenhouse gases.

## 3. Improvement of university-affiliated facilities

Consider improving facilities by building new student dormitories and student assembly halls and enhancing accommodation for foreigners, and promote such ideas as and when they become possible.

## IX. The Way Forward

Strive to manifest the content of this vision by appropriately reflecting it in the formulation of our second set of mid-term objectives and plans (fiscal 2010-2015), establishing a special task force directly under the president, pressing ahead with formulation of an action plan and considering the feasibility of realizing fiscal resources and organizational systems.

The entire university will cooperate and endeavor to improve the education and research system, and will not only manifest the formulated vision, but also lead reform in higher education and realize a truly world-class science and engineering university.

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### Notes:

- <sup>i</sup> Knowledge, skill, ambition, peace-minded and harmony-seeking ... Words defining people who not only have a foundation of specialized knowledge and proven skills, but who also have great ambition and the desire to understand the essence of things and cooperate peacefully and harmoniously with the people around them. The “peace-mind and harmony-seeking” referred to here derives from the traditional Japanese “interact with people peacefully and harmoniously” and refers to the desire to understand the essence of things and cooperate with people toward a common goal. (Source: Nakanishi Susumu. *Kokka wo kizuita shinayaka na nihon chie* (Flexible Japanese wisdom that created the nation). Wedge, 2007.)
- <sup>ii</sup> Scientific creators ... These words are used to describe people who are not only highly specialized in science and engineering and have a broad education, but who also detect and endeavor to resolve problems of their own accord, and have the desire to contribute in flexible and open-minded ways toward development of society.
- <sup>iii</sup> University standing ... The overall standing of the university. Its standing in terms of education, research, students, business, organization, international and social contribution, culture and sports, alumni, etc.
- <sup>iv</sup> TSUBAME...Tokyo-tech Supercomputer and Ubiquitously Accessible Mass-storage Environment
- <sup>v</sup> Satellite lab ... Research labs with ancillary functions located off-campus.
- <sup>vi</sup> Management professor ...Faculty posts specializing in organizational management for those who do not engage in education and research as their primary duty.
- <sup>vii</sup> Four-University Alliance ... Four universities, Tokyo Medical and Dental University, Tokyo University of Foreign Studies, Tokyo Institute of Technology and Hitotsubashi University, concluded an agreement of association with the aim of expanding students’ options in terms of study and careers by facilitating the education of students with knowledge in a broad range of disciplines by enabling them to study subjects that are not provided at certain universities, transfer between universities, acquire multiple degrees, etc.